

United States Patent Application  
For

DEFAULT SOURCE SETUP FOR CHANNEL NUMBERS

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"Express Mail" mailing label number EL234215575.US

Date of Deposit: December 21, 1999

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661321-0010460

## DEFAULT SOURCE SETUP FOR CHANNEL NUMBERS

### FIELD OF THE INVENTION

The present invention is directed to a system and method that receives  
5 television programs from multiple sources. More particularly, the present  
invention is directed to a system and method for programming channel  
numbers to a default source.

### BACKGROUND OF THE INVENTION

10 Within the past decade, the variety of sources for providing television  
programs have increased dramatically. Today television programs are  
transmitted using analog or digital signals through airwaves, cable, and  
satellites. As such, a user is capable of tuning to stations providing television  
programs that may originate from multiple sources through a receiver or set-  
15 top box. For example, a user may have set-top box connected with a local  
antenna to receive television programs broadcasted through the airwaves. The  
set-top box may also receive television programs via a cable connection. In  
addition, the set-top box may receive television programs through a satellite  
system, for example, the RCA Direct Satellite System™ or DSS™ (Direct Satellite  
20 System and DSS are trademarks of Hughes Communications, a division of  
General Motors).

Because each source includes a number of stations for providing  
television programs, the number of stations available to a user has increased  
from one to hundreds of stations. For each station, there is a corresponding  
25 channel number that is used to tune to the station. Consequently, the number  
of channel numbers available to a user is limited. As a result, a user receiving

multiple sources for providing television programs may have a channel number that may tune to multiple stations from different sources. In such a case, the channel number is considered "over-lapping."

In prior systems, channel numbers, which may include over-lapping  
5 channel numbers, are designated to a default source based on which source the set-top box is configured to receive. That is, a user must press a switch or button on the set-top box to change the default source. Consequently, in such prior systems, the ability to select a default source is not seamlessly integrated and a user is unable to select easily a default source for programming channel  
10 numbers.

09470400-123456  
667227-00707460

## SUMMARY OF THE INVENTION

A system and method, which are seamlessly integrated, for allowing a user to select a default source to program channel numbers are disclosed. In one embodiment, the system provides a simple to use electronic system guide that allows a user to select a default source to program over-lapping channel numbers to the default source. The system includes at least one channel number usable by a plurality of sources for providing a station to transmit television programs. The system generates the electronic system guide identifying the plurality of sources. The system allows a user to select one of the plurality of sources as the default from the electronic system guide. The system programs the at least one channel number to tune to a station for receiving television programs provided by the selected default source.

In another embodiment, the system provides an electronic system guide that allows a user to select default sources to program automatically channel numbers. The system allows a user to select a first default source to program channel numbers. The system determines if there are over-lapping channel numbers, which are usable by a plurality of sources. If there are no over-lapping channel numbers, the system programs the channel numbers to the selected first default source. If there are over-lapping channel numbers, the system lists the plurality of sources that may use the over-lapping channel numbers. The system allows a user to select a second default source among the listed plurality of sources to program the over-lapping channel numbers. The system then programs the over-lapping channel numbers to tune to a station provided by the selected second default source and programs any non-over-lapping channel numbers to tune to a station provided by the selected first default source.

## **BRIEF DESCRIPTION OF THE DRAWINGS**

The objects, features, and advantages of the present invention will be apparent to one skilled in the art from the following detailed description in which:

5           **Figure 1** is a simplified block diagram illustrating one embodiment of the system of the present invention;

**Figure 2** is a simplified block diagram of one embodiment of a set-top box that provides an electronic system guide in accordance with the teachings of the present invention;

10           **Figure 3** is a flow chart illustrating one embodiment of the process for providing a default source to program channel numbers;

**Figure 4** is flow chart illustrating one embodiment of the process for providing default sources to program automatically channel numbers;

15           **Figure 5** illustrates one exemplary graphical user interface pop-up window for an electronic system guide that enables a user to select a source for programming over-lapping channel numbers; and

**Figure 6** illustrates one exemplary graphical user interface pop-up window for an electronic system guide that enables a user to select a source for programming over-lapping channel numbers.

## DETAILED DESCRIPTION

In the following description, for purposes of explanation, numerous details are set forth in order to provide a thorough understanding of the present invention. However, it will be apparent to one skilled in the art that these  
5 specific details are not required in order to practice the present invention. In other instances, well known electrical structures and circuits are shown in block diagram form in order not to obscure the present invention unnecessarily.

The system of the present invention provides a seamlessly integrated and simple to use electronic system guide to select a default source to program  
10 channel numbers. The electronic system guide is displayed to a user as a graphical user interface. The graphical user interface allows a user to select easily a default source for programming channel numbers. The electronic guide also allows a user to select a default source for programming over-lapping channel numbers. A simplified block diagram of the system is illustrated in  
15 **Figure 1.** Referring to **Figure 1**, system 100 includes a set-top box 105, television 120, remote controller 130, and a plurality of programming sources 1 (110) through N (114).

Set-top box 105 is a receiver of television signals for television 120. Set-top box 105 is configured to receive television signals from programming  
20 sources 1 (110) through N (114). For example, programming sources 1 (110) through N (114) may be local TV antenna source, cable source, or a satellite source that transmit signals to set-top box 105 through a local antenna, cable connection, and satellite system, such as, for example, the DSS™ system. Set-top box may receive digital or analog signals from programming sources 1 (110)  
25 through N (114) through the local antenna, cable connection, and satellite system. Each programming source also includes a number of stations that

transmit television programs using a television signal for a specific channel utilized by television 120. Set-top box 105 is also configured to program channel numbers for television 120 to tune to a station for receiving television programs provided by one of programming sources 1 (110) through N (114).

5 Set-top box 105 is also configured to generate system guide 101 on display 125 of television 120. System guide 101 is a graphical user interface to provide a user the capability to configure the system. For example, system guide 101 may provide a number of options for a user to select, such as, for example, a local station setup that allows a user to select a default source in  
10 programming channel numbers for television 120 to tune to stations provided by the selected default source. For example, a user can select programming source 1 (110) as a default source to program the channel numbers. Although the set-top box 105 is illustrated as a separate device coupled between television 120 and programming source 1 (110) through programming source N (114), it is  
15 apparent that its functionality may be incorporated in other devices including television 120.

System guide 101 also provides an auto-program pop-up 102. Auto-program pop-up 102 is pop-up menu or sub-menu within system guide 101 that provides a user the option to program automatically ("auto-program") the  
20 channel numbers for television 120 and to determine if there are over-lapping channel numbers. Over-lapping channel numbers are channel numbers that may be used by a plurality of programming sources. For example, programming source 1 (110) and programming source 2 (112) may both provide a station that tunes to channel number 100. In such a case, channel number 100  
25 is over-lapping. If there are over-lapping channel numbers, auto-program pop-up 102 provides a user the capability to select a default source for the over-

lapping channel numbers. After a user selects a default source, the overlapping channel numbers are programmed by the set-top box 105 to tune to a station provided by the selected default source.

Remote controller 130 is a control device for a user to provide inputs to television 120 and set-top box 105. Remote controller 130 includes input pad 132 that may have alpha-numeric keys, options keys, function keys, and other like keys to operate set-top box 105 and television 120. Typically, input pad 132 includes a menu key that displays a system menu having an option for system guide 101 or the input pad 132 may have a separate key to access directly system guide 101.

*Sub A1* Figure 2 is a simplified block diagram of one embodiment of a set-top box 105 in Figure 1. Referring to Figure 2, set-top box 105 includes a processor 101, selector 103, interface 108, and memory 102. Processor 101 is coupled with selector 103, memory 102, and interface 108. Selector 103 receives inputs from programming source 1 (110) through N (114) and outputs a selected television signal based on one of the inputs to interface 108. Interface 108 couples processor 101 and selector 103 with television 120.

*Sub A2* Memory 102 stores system guide program 104 and auto-program 106. Memory 102 may store other programs such as, for example, a programming guide. Memory 102 may include, for example, read only memory (ROM), random access memory (RAM), flash memory, or any other suitable memory. System guide program 104 is executable instructions used by processor 101 to generate an electronic system guide such as system guide 101 on display 125 of television 120. System guide program 104 may also include executable instructions used by processor 101 to program channel numbers for television



A2  
cancel

120 to tune to a station provided by a selected input of selector 103 as a default source.

Sub A3

In one embodiment, system guide 101 includes a local station setup option that allows a user to program channel numbers for television 120.

- 5 Within local station setup, system guide 101 may provide an "auto-program" option to program automatically ("auto-program") the channel numbers for television 120. Thus, auto-program 106 is executable instructions used by processor 101 to generate auto-program pop-up 102 that allows a user to select a default source to auto-program the channel numbers for television 120. Auto-
- 10 program 106 may also include executable instructions used by processor 101 to instruct selector 103 to select a specified input to derive an output television signal to television 120 through interface 108. For example, auto-program 106 generates auto-program pop-up 102 to allow a user to select a first default source among one of programming sources 1 (110) through N (114) to auto-
- 15 program the channel numbers for television 120. Auto-program 106 may also be used to determine if there are over-lapping channel numbers. If there are no over-lapping channel numbers, auto-program 106 may be used to auto-program the channel numbers to tune to a station provided by the first selected default source. If there are over-lapping channel numbers, auto-program 106
- 20 may be used to list the plurality of sources that may use the over-lapping channel numbers and allow a user to select a second default source among the listed plurality of sources to auto-program the over-lapping channel numbers. Auto-program 106 may be used to auto-program the over-lapping channel numbers to tune to a station provided by the selected second default source and
- 25 auto-program any non-over-lapping channel numbers to tune to a station provided by the selected first default source.

*Sub A<sup>4</sup>* → Processor 101 is the central processing unit for set-top box 105. Processor 101 is responsible for generating system guide 101 and auto-program pop-up 102 and to control selector 103. Processor 101 is also responsible for processing instruction code contained within system guide program 104 and auto-program 106 within memory 102. Processor 101 may also be responsive to inputs by a user. For example, a user may initiate the system guide 101 by pressing specified keys on input pad 132 of remote controller 130. If a user initiates system guide 101, processor 101 will then execute system guide program 104 to generate a graphical user interface on display 125 to the user.

Figure 3 is a flowchart illustrating one embodiment of the process for programming channel numbers for television 120. At step 310, a user powers on television 120. At step 320, a user selects a menu key on input pad 132 of remote controller 130. A graphical user interface having a menu appears on display 125 listing options for a user to select such as, for example, a "System Guide" option. At step 330, the user using remote controller 130 selects the system guide option that displays system guide 101 on display 125. System guide 101 may display other options such as, for example, a local station set-up option. At step 340, the user using remote controller 130 selects the local station set-up option for programming the channel numbers to television 120. System guide 101 may display an option such as, for example, an "Auto-Program" option to auto-program channel numbers for television 120. At step 350, the user using remote controller 130 selects the auto-program option that displays auto-program pop-up 102 on display 125. The user can then select a default source among programming sources 1 (110) through N (114) to auto-program the channel numbers for television 120 to tune to a selected default source.

Figure 4 is a flowchart illustrating one embodiment of the process for the auto-program option. At step 355, auto-program pop-up 102 is displayed to provide a user a list of sources to select as a first default source. For example, a user may select a cable source, local TV antenna source, or a satellite source as a first default source to program channel numbers for television 120 to tune to a station provided by the selected first default source. The user using remote controller 130 selects a first default source among the listed sources. At step 360, processor 101 within set-top box 105 determines if there are over-lapping channel numbers for television 120. At step 365, if there are over-lapping channel numbers the process continues at step 375 otherwise the process continues to step 370.

*Sub A<sup>5</sup>* → If there are over-lapping channel numbers, at step 375 processor 101 generates a menu listing sources for the user to select as a second default source that provide stations to the over-lapping channel numbers. For example, a user may select a cable source, local TV antenna source, or a satellite source as a second default source to program the over-lapping channel numbers for television 120 to tune to a station provided by the selected second source. At step 380, a user selects a second default source to auto-program the over-lapping channel numbers. At step 385, processor 101 executes auto-program 106 to auto-program the over-lapping channel numbers to the selected second source and any non-over-lapping channel numbers to the selected first default source. At step 370, If there are no over-lapping channel numbers processor 101 executes auto-program 101 to auto-program the channel numbers for television 120 to tune to stations provided by the selected first default source.

Figure 5 illustrates one exemplary graphical user interface for an auto-program pop-up for the electronic system guide. Referring to Figure 5, the

auto-program pop-up window is for a cable source and satellite source overlap. The pop-up allows a user to select a default source for channel numbers 100-125, which may be used by both a cable and satellite source. For example, if a user selects the satellite source that is highlighted, auto-program will program  
5 channel numbers 110-125 to tune to a station provided by the satellite source.

**Figure 6** illustrates one exemplary graphical user interface for an auto-program pop-up for the electronic system guide. Referring to **Figure 6**, the auto-program pop-up window is for a local TV antenna source and satellite source overlap. The pop-up allows a user to select a default source for channel  
10 numbers that be assigned to both local and satellite stations. For example, if a user selects the satellite source that is highlighted, auto-program will program the channel numbers to be assigned to the satellite stations.

Thus, a system and method, which are seamlessly integrated, for allowing a user to select easily a default source to program channel numbers  
15 have been provided. Although the present invention has been described with reference to specific exemplary embodiments, it will be evident that various modifications and changes may be made to these embodiments without departing from the broader spirit and scope of the invention as set forth in the claims. Accordingly, the specification and drawings are to be regarded in an  
20 illustrative rather than a restrictive sense.